

This Question Paper contains 4 Printed Pages.

16E(A)

MATHEMATICS, Paper - II

(English version)

(Parts A and B)

Time : 2 hrs. 45 min.]

[Maximum Marks : 40

Instructions :

1. 15 minutes of time is allotted exclusively for reading the Question Paper and 2.30 hours for writing the answers.
 2. **Part - A** answers should be written in separate answer book.
 3. There are three sections in **Part-A**.
 4. Answer **all** questions.
 5. Every answer should be written visibly and clearly.
 6. There is internal choice in section - III.
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Part - A

Time : 2 Hours

Marks : 30

SECTION - I

(Marks : 4×1=4)

Note :

- (i) Answer **all** the questions.
- (ii) Each question carries 1 mark.

1. If $A(4,0)$, $B(0,y)$ and $AB = 5$, find the possible values of y .
2. A boy observed the top of an electric pole at an angle of elevation of 30° , when the observation point is 10 meters away from the foot of the pole. Draw suitable diagram for the above situation.

3. Find the value of $\tan^2 45^\circ + \cot^2 30^\circ$.
4. If $P(E) = 0.546$, what is the probability of 'not E' ?

SECTION - II

(Marks : $5 \times 2 = 10$)

Note :

- (i) Answer **all** questions.
- (ii) Each question carries **2** marks.

5. Find the centroid of the triangle, whose vertices are $(-4, 4)$, $(-2, 2)$ and $(6, -6)$.
6. $\triangle ABC \sim \triangle DEF$ and their areas are 64 cm^2 and 121 cm^2 respectively. If $EF = 15.4 \text{ cm}$, then find BC .
7. Prove that $\tan^2 A - \sin^2 A = \tan^2 A \cdot \sin^2 A$.
8. A die is thrown once. Find the probability of getting
- (i) an even number
- (ii) an odd prime number.
9. Write less than cumulative frequency and greater than cumulative frequency table for the following data.

| | | | | | |
|----------------|------|-------|-------|-------|-------|
| Class interval | 5-10 | 10-15 | 15-20 | 20-25 | 25-30 |
| Frequency | 4 | 45 | 20 | 13 | 9 |

SECTION - III

(Marks : 4×4=16)

Note :

- (i) Answer **all** the questions.
- (ii) Choose any **ONE** from each question.
- (iii) Each question carries **4** marks.

10. (a) If $\operatorname{cosec} \theta + \cot \theta = P$, show that $\frac{P^2 + 1}{P^2 - 1} = \sec \theta$.

OR

- (b) Show that the points $(-4, -7)$, $(-1, 2)$, $(8, 5)$ and $(5, -4)$ taken in order are the vertices of a Rhombus.

11. (a) Find the mode of the following data.

| | | | | | |
|----------------|-------|-------|-------|-------|-------|
| Class interval | 50-52 | 53-55 | 56-58 | 59-61 | 62-64 |
| Frequency | 15 | 110 | 135 | 115 | 25 |

OR

- (b) A chord of a Circle of radius 14 cm subtends 120° angle at the centre. Find the area of the corresponding major segment of the circle. ($\pi = 3.14$)

12. (a) A bag contains 20 discs, which are numbered from 1 to 20. If one disc is drawn at random from the bag, find the probability that it bears :

- (i) an even number,
- (ii) Prime number,
- (iii) Multiple of 5,
- (iv) Two digit odd number.

OR

- (b) The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60° . If the tower is 30 m high, find the height of the building.

13. (a) Construct a triangle similar to the given $\triangle ABC$, with its sides equal to $\frac{3}{4}$ of the corresponding sides of the $\triangle ABC$.

OR

- (b) Draw a Circle of radius 4 cm. From a point 7.5 cm away from its centre, construct the pair of tangents to the circle.
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This Question Paper contains 4 Printed Pages.

16E(B)

MATHEMATICS, Paper - II

(English version)

(Parts A and B)

Time : 2 hrs. 45 min.]

[Maximum Marks : 40

Instruction : Write the answers to the questions in this **Part-B** on the Question paper itself and attach it to the answer book of **Part-A**.

Part - B

Time : 30 minutes

Marks : 10

SECTION - IV

(Marks : $20 \times \frac{1}{2} = 10$)

Note :

- (i) Answer **all** the questions.
- (ii) Each question carries $\frac{1}{2}$ mark.
- (iii) Marks will **not** be awarded in any case of over-written, rewritten or erased answers.
- (iv) Each question has four options. Write the **CAPITAL LETTERS** (A, B, C, D) showing the correct answer for the following questions in the brackets provided against them.

14. Slope of the line passing through the points $(0, \sin 60^\circ)$ and $(\cos 30^\circ, 0)$ is

[]

(A) 0

(B) 1

(C) -1

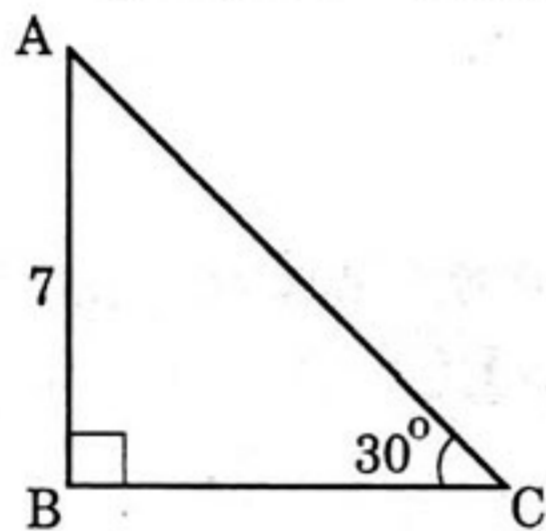
(D) $\sqrt{3}$

15. $\triangle ABC \sim \triangle PQR$ and $\angle A + \angle B = 115^\circ$, then $\angle R = \dots\dots$ []
 (A) 55° (B) 65°
 (C) 75° (D) 45°

16. The area of a sector, whose radius is 7 cm and the angle is 120° , is sq. cm. []
 (A) 51.3 (B) 51.4
 (C) 51.5 (D) 51.6

17. If $\sec \theta - \tan \theta = 3$, then $\sec \theta + \tan \theta = \dots\dots$ []
 (A) 1 (B) $\frac{1}{2}$
 (C) $\frac{1}{3}$ (D) $\sqrt{2}$

18. In the given figure, $BC = \dots\dots$ units. []



- (A) $7\sqrt{3}$
 (B) $7\sqrt{2}$
 (C) 7
 (D) 5

19. From a deck of cards, a card is drawn at random, then the probability of getting a red king is []

- (A) $\frac{1}{13}$ (B) $\frac{3}{14}$
 (C) $\frac{3}{26}$ (D) $\frac{1}{26}$

20. The mean of first four odd prime numbers is []

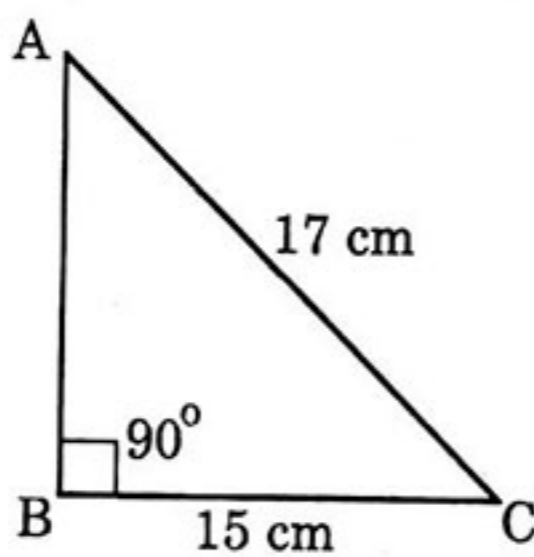
- (A) 6.5 (B) 7.5
 (C) 8.5 (D) 9.5

21. The distance of a point (3, 4) from the origin is units. []

- (A) 5 (B) 6
 (C) 7 (D) 8

22. In $\triangle ABC$, $AB = \dots\dots\dots$ cm.

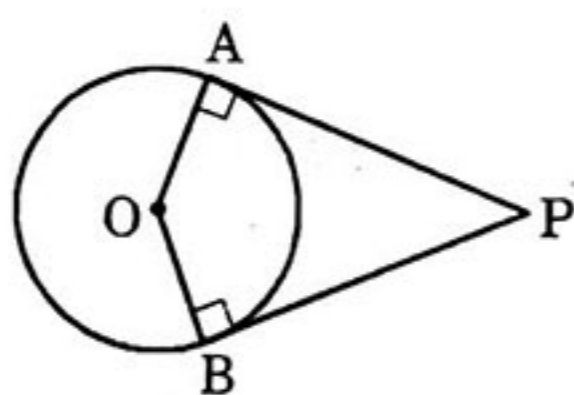
[]



- (A) 5
- (B) 6
- (C) 7
- (D) 8

23. In the given figure, $\angle AOB = 120^\circ$, then $\angle APO = \dots\dots$

[]



- (A) 30°
- (B) 45°
- (C) 60°
- (D) 90°

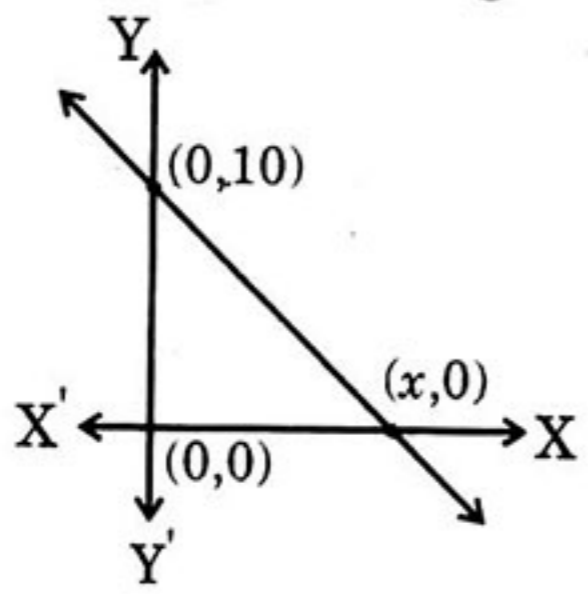
24. A.M. of $x - 5$, x , $x + 5$ is $\dots\dots$

[]

- (A) $\frac{x}{2}$
- (B) x
- (C) $2x$
- (D) $5x$

25. The area of given triangle is 60 sq. units, then $x = \dots\dots$ units.

[]



- (A) 6
- (B) 8
- (C) 10
- (D) 12

26. If $\sin 2\theta = \cos 3\theta$, then $\theta = \dots\dots$

[]

- (A) 15°
- (B) 18°
- (C) 21°
- (D) 24°

27. A boy observed 20 m away from the base of a 20 m high pole, the angle of elevation of the top is $\dots\dots$

[]

- (A) 15°
- (B) 30°
- (C) 45°
- (D) 60°

28. If $P(E) = 1$, then $P(\bar{E}) = \dots\dots$ []
- (A) 0 (B) 1
(C) $\frac{2}{3}$ (D) $\frac{3}{2}$
29. If $\triangle ABC$, $DE \parallel BC$, $AD = 2$ cm, $DE = 3$ cm and $AB = 6$ cm, then $BC = \dots\dots$ cm. []
- (A) 3 (B) 6
(C) 9 (D) 12
30. The length of the tangent drawn from a point 6 cm away from the centre of a circle with radius 3 cm is $\dots\dots$ cm. []
- (A) $2\sqrt{3}$ (B) $3\sqrt{3}$
(C) 3 (D) 4
31. When a die is rolled, the probability of getting an odd prime number is $\dots\dots$ []
- (A) $\frac{1}{3}$ (B) $\frac{2}{3}$
(C) $\frac{1}{6}$ (D) 3
32. If $\cos \theta = \frac{3}{5}$, then $\sin \theta = \dots\dots$ []
- (A) $\frac{3}{4}$ (B) $\frac{4}{5}$
(C) $\frac{5}{12}$ (D) $\frac{5}{13}$
33. Mode of 3, 4, 5 and x is 5, then $x = \dots\dots$ []
- (A) 3 (B) 5
(C) 4 (D) 8